



SVP-98-263

July 27, 1998

United States Nuclear Regulatory Commission
Washington, DC 20555

Attention: Document Control Desk

Reference: Quad Cities Nuclear Power Station
Docket Number 50-254, DPR-29, Unit One

Enclosed is Licensee Event Report (LER) 98-018, Revision 00, for Quad Cities Nuclear Power Station.

This report is submitted in accordance with the requirements of the Code of Federal Regulations, Title 10, Part 50.73(a)(2)(iv). The licensee shall report any event or condition that resulted in manual or automatic actuation of any Engineered Safety Feature.

The following commitments are being made by this letter:

1. Examination and any necessary cleaning of the Unit 1 Scram Discharge Instrument Volume (SDIV) level switch bellows housings is planned for the Q1R15 refueling outage (NTS 25418098SCAQ0001801; due January 15, 1999). The SDIV will be examined to determine the effects of hydrolasing on the instruments. Evaluation by System Engineering of the results will be completed to determine if additional corrective actions and recurrence controls are required for the SDIV or other systems as part of NTS 25418098SCAQ0001801.
2. Examination and any necessary cleaning of the Unit 2 SDIV level switch bellows housings is scheduled for the next planned Unit 2 outage of sufficient duration (NTS 25418098SCAQ0001802; due June 15, 1999). The SDIV will be examined to determine the effects of hydrolasing on the instruments. Evaluation by System Engineering of the results will be completed to determine if additional corrective actions and recurrence controls are required as part of NTS 25418098SCAQ0001802.

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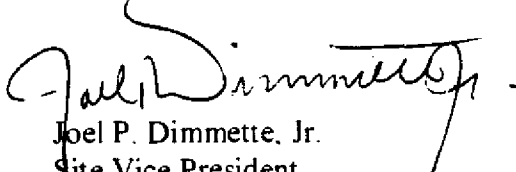
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If there are any questions or comments concerning this letter, please refer them to Charles Peterson, Regulatory Affairs Manager at 309-654-2241, ext. 3609.

Sincerely,



Joel P. Dimmette, Jr.
Site Vice President
Quad Cities Station

JPD/CP/slv

Enclosure

cc: C. J. Paperiello, Acting Regional Administrator, Region III
R. M. Pulsifer, Project Manager, NRR
C. G. Miller, Senior Resident Inspector, Quad Cities
W. D. Leech, MidAmerican Energy Company
D. C. Tubbs, MidAmerican Energy Company
INPO Records Center
Office of Nuclear Facility Safety, IDNS
Stanley P. Focht, American Nuclear Insurers

Facility Name (1)										Docket Number (2)										Page (3)									
Quad Cities Unit One										0 5 0 0 0 2 5 4										1 of 5									
Title (4) Full Reactor SCRAM Occurred While Performing Technical Specification (TS) Required Weekly Average Power Range Monitor (APRM) Surveillance on Reactor Protection System (RPS) Channel A Due to Spurious Trip from RPS Channel B SCRAM Discharge Instrument Volume (SDIV) Level Instrumentation																													
Event Date (5)					LER Number (6)										Report Date (7)					Other Facilities Involved (8)									
Month		Day		Year	Year	Sequential Number			Revision Number		Month		Day		Year	Facility Names		Docket Number(s)											
0		6		1998	1998	0 1 8			0 0		0		7		1998			0 5 0 0 0											
0		6		1998	1998	0 1 8			0 0		0		7		1998			0 5 0 0 0											
OPERATING MODE (9)					THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)																								
POWER LEVEL (10)					20.402(b)					20.405(c)					X					50.73(a)(2)(iv)					73.71(h)				
1 0 0					20.405(a)(1)(i)					50.36(c)(1)										50.73(a)(2)(v)					73.71(e)				
					20.405(a)(1)(ii)					50.36(c)(2)										50.73(a)(2)(vii)					Other (Specify in				
					20.405(a)(1)(iii)					50.73(a)(2)(i)										50.73(a)(2)(viii)(A)					Abstract below and				
					20.405(a)(1)(iv)					50.73(a)(2)(ii)										50.73(a)(viii)(B)					in Text				
					20.405(a)(1)(v)					50.73(a)(2)(iii)										50.73(a)(2)(x)									
LICENSEE CONTACT FOR THIS LER (12)																													
Name															TELEPHONE NUMBER														
Charles Peterson, Regulatory Affairs Manager, ext. 3609															AREA CODE														
															3 0 9 6 5 4 - 2 2 4 1														
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																													
CAUSE		SYSTEM		COMPONENT			MANUFACTURER			REPORTABLE TO EPIX		CAUSE		SYSTEM		COMPONENT			MANUFACTURER			REPORTABLE TO EPIX							
SUPPLEMENTAL REPORT EXPECTED (14)															Expected Submission Date (15)														
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)															<input checked="" type="checkbox"/> NO														
ABSTRACT (Limit to 1400 spaces, i.e. approximately fifteen single-space typewritten lines) (16)																													

ABSTRACT:

On 06271998 at 1711, a Unit One full reactor SCRAM occurred from 100% power during the performance of Technical Specification weekly APRM surveillance QCIS 0700-07 Power Operation APRM Functional Test by Instrument Maintenance. The expected Reactor Protection System (RPS) ½ SCRAM signal from an APRM 2 Hi Hi on RPS Channel A was in process of verification when a ½ SCRAM signal coincidentally initiated from the RPS Channel B Scram Discharge Instrument Volume (SDIV) Hi level due to a spurious trip from a level transmitter.

The plant and the operations crew responded properly to the SCRAM. All control rods inserted and all safety systems functioned as expected. A prompt investigation into the cause determined from the Sequential Events Recorder (SER) that the B RPS SCRAM trip from the SDIV Hi level was received after the APRM 2 Hi Hi was recorded. The investigation determined that ITT Barton electronic level transmitter 1-302-109D for the SDIV level had initiated a spurious trip causing the 1-500 100D RPS Channel B relay to de-energize as designed.

The safety significance to health and safety of onsite personnel and to the public was minimal. Corrective actions included replacing the level transmitter, reviewing industry information applicable to the ITT Barton 764/765 transmitters, performing appropriate testing to ensure operability, and evaluating the operability of the remaining transmitters. Root cause investigation revealed mechanical binding of the process sensor bellows by particulate crud caused a zero shift that resulted in the apparent level exceeding the setpoint. There was no correlation found with this spurious trip and previous 10CFR Part 21 issues documented for this type transmitter.

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LICENSEE EVENT REPORT (LER) TEXT CONTINUATION													Form Rev. 2.0				
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TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																	

PLANT AND SYSTEM IDENTIFICATION:

General Electric - Boiling Water Reactor - 2511 MWt rated core thermal power.

EVENT IDENTIFICATION: Full Reactor SCRAM Occurred While Performing Technical Specification (TS) Required Weekly Average Power Range Monitor (APRM) Surveillance on Reactor Protection System (RPS) Channel A Due to Spurious Trip from RPS Channel B Scram Discharge Instrument Volume (SDIV) Level Instrumentation.

A. CONDITIONS PRIOR TO EVENT:

Unit:	1	Event Date:	06271998	Event Time:	1711
Reactor Mode:	1	Mode Name:	Power Operation	Power Level:	100%

This report was initiated by Licensee Event Report 254/98-018

Power Operation (1) - Mode switch in the RUN position with average reactor coolant temperature at any temperature.

B. DESCRIPTION OF EVENT:

On 06271998 at 1711, a unit one full reactor SCRAM occurred from 100% power during the performance of Technical Specification weekly APRM surveillance QCIS 0700-07 "Power Operation APRM Functional Test" by Instrument Maintenance. The expected Reactor Protection System (RPS) ½ SCRAM signal from an APRM 2 Hi Hi on RPS Channel A was in process of verification when a ½ SCRAM signal coincidentally initiated from the RPS Channel B SDIV [AA] [JC] Hi level due to a spurious high level trip.

A prompt investigation into the cause determined from the Sequential Events Recorder (SER) that the B RPS SCRAM trip from the SDIV Hi level was received less than one second after the APRM 2 Hi Hi SCRAM trip from the weekly APRM functional test was recorded. ITT Barton electronic level transmitter 1-302-109D for the SDIV level had failed causing the 1-500-100D RPS Channel B relay to de-energize as designed. Based on field measurement of transmitter output typical of electronic failure, the transmitter internal circuit card was replaced by Instrument Maintenance. The transmitter was then re-calibrated and verified operable. Research into previous 10CFR Part 21 issues related to ITT Barton 764/765 transmitters, revealed a problem with internal lead wire insulation wear as the root cause of previous failures in this instrument type. No such lead wire wear was found. Subsequent bench testing of the circuit board revealed no failed components or other anomalies.

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B. DESCRIPTION OF EVENT (continued):

On 07/11/1998 another spurious ½ SCRAM was received from the same source. Another prompt investigation into this failure revealed that the transmitter zero had shifted such that the Hi level setpoint was coincident with the normal SDIV level. Capillary tube leakage was initially thought to be responsible for the zero shifting, prompting replacement of the entire transmitter assembly, which included the capillary tubes and sensing bellows. There was an additional historical Part 21 issue concerning air in-leakage from the reference leg gradually causing a slow, long term upward shift in the transmitter output, but this also was not relevant to the failure. Removal of the sensing bellows from their housings during replacement revealed particulate fouling throughout both housings and within the bellows folds.

The ITT Barton 764 electronic differential pressure transmitter with the associated sealed capillary tubing and sensing bellows was taken to the Instrument Maintenance (IM) hot shop where it was analyzed by two senior technicians and a System Engineer. They found no external damage that could have contributed to the problem. Testing revealed that it was properly responding to pressure changes and no further zero shifts occurred. The in process zero shifting was attributed to the particulate crud buildup found when the process sensing bellows were removed from their housings. This particulate crud apparently inhibited free bellows movement and is the root cause of both spurious trips.

A review of the calibration history of all SDIV level switches in both units indicated a historical trend of lesser magnitude zero shifts of 1-302-109D. There were isolated small zero shifts of some of the other transmitters in the past, but no other clear trends were found. Hydrolasing of the SCRAM Discharge Headers to obtain lower dose rates was identified as a possible contributing factor to the particulate crud accumulation in the SDIV bellows housings.

C. CAUSE OF THE EVENT:

The ITT Barton 764 electronic differential pressure transmitter testing revealed that it was properly responding to pressure changes. The in process zero shifting was attributed to the particulate crud buildup found when the process sensing bellows were removed from their housings. This particulate crud apparently inhibited free bellows movement and is the root cause of both spurious trips. Hydrolasing of the SCRAM Discharge Headers to obtain lower dose rates was identified as a possible contributing factor to the particulate crud accumulation in the SDIV bellows housings.

D. SAFETY ANALYSIS:

The safety significance to health and safety of onsite personnel and to the public was minimal. The spurious transmitter trip caused the associated RPS relay to de-energize as designed. RPS properly responded by de-energizing the SCRAM contactors. A full reactor SCRAM was initiated as designed, all control rods inserted and all plant safety systems responded as expected. There were no safety concerns associated with the SCRAM or any personnel actions.

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TEXT Energy Industry Identification System (EIIIS) codes are identified in the text as [XX]																			

E. CORRECTIVE ACTIONS:

Corrective Actions Completed:

1. The bellows housings were cleaned and the entire transmitter assembly, including the vendor sealed capillary tubing and the process sensor bellows, was replaced. The new transmitter was calibrated and appropriate testing was performed to verify the operability of the SDIV level logic (completed 07111998).
2. A review of industry information as applicable to ITT Barton 764/765 differential pressure transmitters was completed to determine if additional corrective actions were required. No specific correlation to previous Part 21 issues was found. A previous instance of bellows fouling causing erratic operation of an ITT Barton 764 SDIV level instrument at Cooper I in 1994 was found in the Nuclear Plant Reliability Data System (NPRDS) (review completed 07151998).
3. QCIS 0700-09 "Prior to Startup Neutron Monitoring Calibration/Functional Test", an analogous Tech Spec surveillance functional test for the different reactor mode, was performed to determine if there was any possible unknown interaction between APRM 2 and the RPS Channel B SDIV high level. There was none (completed 06281998).
4. The removed transmitter was bench tested and determined to be responding to pressure changes correctly after the bellows fouling was removed (completed 07141998).
5. Three year calibration history of Barton SDIV level transmitters 1(2)-0302-109C, D, J & K was reviewed for previous zero shifts. Some smaller shifts were noted (completed 07171998).
6. PIF Q1998-03257 and Q1998-03258 were initiated on 07231998 to evaluate operability of the remaining instruments 1(2)-0302-109C, D, J and K. An issue screening was performed in accordance with QCAP 0230-07 "Operability Determination" and the instruments were found operable.

Corrective Actions to be Completed:

1. Examination and any necessary cleaning of the Unit 1 SDIV level switch bellows housings is planned for the Q1R15 refueling outage (NTS 25418098SCAQ0001801 due 01151999). The SDIV will be examined to determine the effects of hydrolasing on the instruments. Evaluation by System Engineering of the results will be completed to determine if additional corrective actions and recurrence controls are required for the SDIV or other systems as part of NTS 25418098SCAQ0001801.
2. Examination and any necessary cleaning of the Unit 2 SDIV level switch bellows housings is scheduled for the next planned Unit 2 outage of sufficient duration (NTS 25418098SCAQ0001802 due 06151999). The SDIV will be examined to determine the effects of hydrolasing on the instruments. Evaluation by System Engineering of the results will be completed to determine if additional corrective actions and recurrence controls are required as part of NTS 25418098SCAQ0001802.

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F. PREVIOUS OCCURRENCES:

A search of the Quad Cities LER database for the past two years revealed no other similar events where coincident instrument failure caused a SCRAM during a planned surveillance.

Fouling due to particulate accumulation from hydrolasing activities was documented in LER 265/97-003 "B Core Spray Room Cooler Fouled Due To Hydrolyzing (sic) Debris." The corrective actions for this LER would not have prevented this event.

G. COMPONENT FAILURE DATA:

There was no component failure.

REGULATORY INFORMATION DISTRIBUTION SYSTEM (RIDS)

SUBJECT: **Forwards LER 98-018-00,IAW 10CFR50.73(a) (2) (iv).Commitments made within ltr.listed.**

NOTES:

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	AEOD/SPD/RRAB		1	1	FILE CENTER		1	1
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	NRR/DE/EMEB		1	1	NRR/DRCH/HICB		1	1
	NRR/DRCH/HOHB		1	1	NRR/DRCH/HQMB		1	1
	NRR/DRPM/PECB		1	1	NRR/DSSA/SPLB		1	1
	RES/DET/EIB		1	1	RGN3 FILE 01		1	1
EXTERNAL:	L ST LOBBY WARD		1	1	LITCO BRYCE, J H		1	1
	NOAC POORE, W.		1	1	NOAC QUEENER, DS		1	1
	NRC PDR		1	1	NUDOCS FULL TXT		1	1

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